

We Claim:

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5 A smoking article having reduced ignition propensity comprising:  
a tobacco column and  
a wrapper having a base permeability and surrounding the tobacco column so that  
the smoking article includes an ignition end and a distal end, the wrapper comprising:  
an untreated area and  
a least one discrete area treated with a composition comprising a  
permeability reducing substance initially dissolved in a non-derivatizing solvent  
mixture initially comprising a solvent and at least one ingredient that as part of the  
10 non-derivatizing solvent mixture is a self-association disruptor for the  
permeability reducing substance to reduce the base permeability so that as a coal  
of a burning tobacco firecone advances by the treated area, the smoking article  
self-extinguishes if placed on a surface.

15 2. The smoking article of Claim 1 wherein said smoking article is one of a  
population of a plurality of smoking articles having a reduced ignition propensity.

3. The smoking article of Claim 2 wherein said at least one discrete area treated is at  
20 least one banded region between the ignition end and the distal end and a distance from  
the ignition end to the at least one band of each smoking article within said population of  
said plurality of smoking articles is at least one of sequentially related, randomly related  
and quasi-randomly related within said population.

25 4. The smoking article of Claim 2 wherein said population of smoking articles is a  
package of smoking articles.

5. The smoking article of Claim 2 wherein said population of smoking articles is a  
grab sample of smoking articles.

30 6. The smoking article of Claim 2 wherein the ignition propensity for the population  
is between about 50 percent and substantially about 100 percent.

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7. The smoking article of Claim 2 wherein said at least one discrete area treated is at least two spaced apart banded regions and a distance from the ignition end to at least one band of each smoking article is at least one of sequentially related, randomly related and quasi-randomly related within said population.

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8. The smoking article of Claim 7 wherein said distance is sequentially related.

9. The smoking article of Claim 7 wherein said distance is randomly related.

10 10. The smoking article of Claim 7 wherein said distance is quasi-randomly related.

11. The smoking article of Claim 7 wherein said at least two banded regions are spaced sufficiently to reduce the ignition propensity of the smoking article.

15 12. The smoking article of Claim 7 wherein said at least two banded regions are spaced sufficiently to facilitate the freeburn of the smoking article.

13. The smoking article of Claim 7 wherein said at least two banded regions have a width/center-to-center spacing ratio of at least about 1/10 to greater than about 1/1.

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14. The smoking article of Claim 7 wherein said at least two banded regions have a width of at least about 3 millimeters to about 10 millimeters.

15. The smoking article of Claim 7 wherein said at least two banded regions have a  
25 center-to-center spacing of about 10 millimeters to about 30 millimeters.

16. The smoking article of Claim 7 wherein said at least two banded regions are visually substantially the same as unbanded regions.

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17. A wrapper for surrounding a tobacco column to create a smoking article having reduced ignition propensity that includes an ignition end and a distal end, the wrapper having a base permeability and comprising:

an untreated area and

at least one discrete area treated with a permeability reducing substance in an amount equivalent to between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC), said permeability reducing substance applied using a composition comprising said permeability reducing substance initially dissolved in a non-derivatizing solvent mixture initially comprising a solvent and at least one ingredient that as part of the non-derivatizing solvent mixture is a self-association disruptor for the permeability reducing substance to reduce the base permeability so that as a coal of a burning tobacco firecone advances by the treated area, the smoking article self-extinguishes if placed on a surface.

18. The wrapper according to claim 17 wherein said ingredient is a salt.

19. The wrapper according to claim 18 wherein said salt is a lithium containing compound.

20. The wrapper according to claim 19 wherein said lithium containing compound is lithium chloride in an amount that facilitates the dissolution of said permeability reducing substance in said non-derivatizing solvent mixture while upon burning the characteristic of ash for the untreated area and the at least one treated area is substantially the same.

21. The wrapper according to claim 17 wherein said solvent component is organic.

22. The wrapper according to claim 41 wherein said organic solvent component is an amide.

23. The wrapper according to claim 22 wherein said amide is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

24. The wrapper according to claim 20 wherein said solvent component is organic.

25. The wrapper according to claim 24 wherein said organic solvent component is an amide.

26. The wrapper according to claim 25 wherein said amide is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

5 27. The wrapper according to claim 17 wherein said permeability reducing substance is a pore filling substance, such that pores are filled to reduce the permeability of the at least one treated area.

28. The wrapper according to claim 17 wherein said permeability reducing substance  
10 is a film forming substance, such that a film is formed to reduce the permeability of said at least one treated area.

29. The wrapper according to claim 17 wherein said permeability reducing substance  
15 is a polymer.

30. The wrapper according to claim 29 wherein said polymer is a polysaccharide.

31. The wrapper according to claim 30 wherein said polysaccharide is a starch.

20 32. The wrapper according to claim 31 wherein said starch is substantially non-derivatized.

33. The wrapper according to claim 30 wherein the polysaccharide is a cellulose.

25 34. The wrapper according to claim 33 wherein the cellulose is substantially non-derivatized.

35. The wrapper according to claim 30 wherein the polysaccharide is a chitosan.

36. The wrapper according to claim 35 wherein chitosan is substantially  
30 non-derivatized.

37. The wrapper according to claim 30 wherein the polysaccharide is a chitin.



38. The wrapper according to claim 37 wherein the chitin is substantially non-derivatized.
39. The wrapper according to claim 30 wherein the polysaccharide is an alginate.
40. The wrapper according to claim 39 wherein the alginate is substantially non-derivatized.
41. The wrapper according to claim 17 wherein the discretely treated area comprises a band.
42. The wrapper according to claim 41 wherein the band has a sufficient width so as to deprive the coal of the burning tobacco firecone of oxygen from behind a char line of the wrapper.
43. The wrapper according to claim 41 wherein the band has a width of at least about 3 millimeters.
44. The wrapper according to claim 17 wherein the discretely treated area comprises at least two bands spaced sufficiently to reduce the ignition propensity of the smoking article.
45. The wrapper according to claim 44 wherein the at least two bands have widths and are spaced apart so that a width to center-to-center spacing ratio is between about 1/10 and about 1/1.
46. The wrapper according to claim 45 wherein the at least two bands have widths between about 3 millimeters and about 10 millimeters.
47. The wrapper according to claim 45 wherein the at least two bands have a center-to-center spacing of about 10 millimeters to about 30 millimeters.

48. The wrapper according to claim 17 that has properties that enable a bobbin of wrapper to be useable in a conventional commercially available cigarette manufacturing machine.

5 49. The wrapper according to claim 17 wherein the treated area is visually substantially the same untreated area.

50. The wrapper according to claim 17 wherein the treated area further includes a filler.

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51. The wrapper according to claim 50 wherein the filler is at least one of clay, talc, calcium carbonate, and titanium oxide.

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15 52. A smoking article having reduced ignition propensity comprising:  
a tobacco column and  
a wrapper having a base permeability and surrounding the tobacco column so that  
the smoking article includes an ignition end and a distal end, the wrapper comprising:  
an untreated area and  
a least one discrete area treated with a permeability reducing substance in  
20 an amount equivalent to between about 0.3 micrograms per square millimeter to  
about 1.2 micrograms per square millimeter of substantially non-derivatized  
cellulose applied using lithium chloride in dimethylacetamide (DMAC), said  
permeability reducing substance applied using a composition comprising said  
permeability reducing substance initially dissolved in a non-derivatizing solvent  
25 mixture initially comprising a solvent component and at least one ingredient that  
as part of the non-derivatizing solvent mixture is a self-association disruptor for  
the permeability reducing substance to reduce the base permeability so that as a  
coal of a burning tobacco firecone advances by the treated area, the smoking  
article self-extinguishes if placed on a surface, wherein said smoking article is one  
30 of a population of a plurality of smoking articles having a reduced ignition  
propensity.

53. The smoking article of Claim 52 wherein said at least one discrete area treated is at least one banded region between the ignition end and the distal end and a distance from the ignition end to the at least one band of each smoking article within said population of said plurality of smoking articles is at least one of sequentially related, randomly related and quasi-randomly related within said population.

54. The smoking article of Claim 52 wherein said population of smoking articles is a package of smoking articles.

55. The smoking article of Claim 5 wherein said population of smoking articles is a grab sample of smoking articles.

56. The smoking article of Claim 52 wherein the ignition propensity for the population is between about 50 percent and substantially about 100 percent.

57. The smoking article of Claim 52 wherein said at least one discrete area treated is at least two spaced apart banded regions and a distance from the ignition end to at least one band of each smoking article is at least one of sequentially related, randomly related and quasi-randomly related within said population.

58. The smoking article of Claim 57 wherein said distance is sequentially related.

59. The smoking article of Claim 57 wherein said distance is randomly related.

60. The smoking article of Claim 57 wherein said distance is quasi-randomly related.

61. The smoking article of Claim 57 wherein said at least two banded regions are spaced sufficiently to reduce the ignition propensity of the smoking article.

62. The smoking article of Claim 57 wherein said at least two banded regions are spaced sufficiently to facilitate the freeburn of the smoking article.

63. The smoking article of Claim 57 wherein said at least two banded regions have a width/center-to-center spacing ratio of at least about 1/10 to greater than about 1/1.

64. The smoking article of Claim 57 wherein said at least two banded regions have a width of at least about 3 millimeters to about 10 millimeters.

65. The smoking article of Claim 57 wherein said at least two banded regions have a center-to-center spacing of about 10 millimeters to about 30 millimeters.

66. The smoking article of Claim 57 wherein said at least two banded regions are visually substantially the same as unbanded regions.

67. The smoking article of Claim 52 wherein said ingredient is a salt.

68. The smoking article of Claim 67 wherein said salt is a lithium containing compound.

69. The smoking article of Claim 68 wherein said lithium containing compound is lithium chloride in an amount that facilitates the dissolution of said permeability reducing substance in said non-derivatizing solvent mixture while upon burning the characteristic of ash for the untreated area and the at least one treated area is substantially the same.

70. The smoking article of Claim 52 wherein said solvent component is organic.

71. The smoking article of Claim 70 wherein said organic solvent component is an amide.

72. The smoking article of Claim 71 wherein said amide is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

73. The smoking article of Claim 69 wherein said solvent component is organic.



74. The smoking article of Claim 73 wherein said organic solvent component is an amide.
75. The smoking article of Claim 74 wherein said amide is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).
76. The smoking article of Claim 52 wherein said permeability reducing substance is a pore filling substance, such that pores are filled to reduce the permeability of the at least one treated area.
77. The smoking article of Claim 52 wherein said permeability reducing substance is a film forming substance, such that a film is formed to reduce the permeability of said at least one treated area.
78. The smoking article of Claim 52 wherein said permeability reducing substance is a polymer.
79. The smoking article of Claim 78 wherein said polymer is a polysaccharide.
80. The smoking article of Claim 79 wherein said polysaccharide is a starch.
81. The smoking article of Claim 80 wherein said starch is substantially non-derivatized.
82. The smoking article of Claim 79 wherein the polysaccharide is a cellulose.
83. The smoking article of Claim 82 wherein the cellulose is substantially non-derivatized.
84. The smoking article of Claim 79 wherein the polysaccharide is a chitosan.
85. The smoking article of Claim 84 wherein chitosan is substantially non-derivatized.



86. The smoking article of Claim 79 wherein the polysaccharide is a chitin.

87. The smoking article of Claim 86 wherein the chitin is substantially non-derivatized.

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88. The smoking article of Claim 79 wherein the polysaccharide is an alginate.

89. The smoking article of Claim 88 wherein the alginate is substantially non-derivatized.

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90. The smoking article of Claim 52 wherein the discretely treated area comprises a band.

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97. The smoking article of Claim 52 that has properties that enable a bobbin of wrapper to be useable in a conventional commercially available cigarette manufacturing machine.
- 5 98. The smoking article of Claim 52 wherein the treated area is visually substantially the same untreated area.
99. The smoking article of Claim 52 wherein the treated area further includes a filler.
- 10 100. The smoking article of Claim 99 wherein the filler is at least one of clay, talc, calcium carbonate, and titanium oxide.
101. A composition for application to a paper having a base permeability to create a wrapper having at least one discretely treated area with a permeability reducing substance in an amount equivalent to between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose and suitable for surrounding a tobacco column to create a smoking article having reduced ignition propensity, said composition initially comprising a permeability reducing substance initially dissolved in a solvent mixture initially comprising an organic solvent component and at least one ingredient that as part of the solvent mixture is a self-association disruptor for the permeability reducing substance such that when the wrapper is dry the at least one discretely treated area has a reduced permeability.
- 15 102. The composition according to claim 101 wherein said ingredient is a salt.
- 25 103. The composition according to claim 102 wherein said salt is a lithium containing compound.
104. The composition according to claim 103 wherein said lithium containing compound is lithium chloride in an amount that facilitates the dissolution of said permeability reducing substance in said non-derivatizing solvent mixture while upon burning the characteristic of ash for the untreated area and the at least one treated area is substantially the same.
- 30

105. The composition according to claim 101 wherein said organic solvent component is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

106. The composition according to claim 104 wherein said organic solvent component is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

107. The composition according to claim 101 wherein said permeability reducing substance is a pore filling substance, such that pores are filled to reduce the permeability of the at least one treated area reducing permeability of the at least one treated area.

108. The composition according to claim 101 wherein said permeability reducing substance is a film forming substance, such that a film is formed to reduce the permeability of said at least one treated area.

109. The composition according to claim 101 wherein said permeability reducing substance is a polymer.

110. The composition according to claim 109 wherein said polymer is a polysaccharide.

111. The composition according to claim 110 wherein said polysaccharide is a starch.

112. The composition according to claim 111 wherein said starch is substantially non-derivatized.

113. The composition according to claim 110 wherein the polysaccharide is a cellulose.

114. The composition according to claim 113 wherein the cellulose is substantially non-derivatized.

115. The composition according to claim 110 wherein the polysaccharide is a chitosan.

116. The composition according to claim 115 wherein the chitosan is substantially non-derivatized.

117. The composition according to claim 110 wherein the polysaccharide is a chitin.

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118. The composition according to claim 117 wherein the chitin is substantially non-derivatized.

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119. The composition according to claim 110 wherein the polysaccharide is an alginate.

120. The composition according to claim 119 wherein the alginate is substantially non-derivatized.

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121. The composition according to claim 101 wherein the discretely treated area comprises a band.

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122. The composition according to claim 121 wherein the band has a sufficient width so as to deprive the coal of the burning tobacco firecone of oxygen from behind a char line of the wrapper.

123. The composition according to claim 121 wherein the band has a width of at least about 3 millimeters.

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124. The composition according to claim 101 wherein the discretely treated area comprises at least two bands spaced sufficiently to reduce the ignition propensity of the smoking article.

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125. The composition according to claim 124 wherein the at least two bands have widths and are spaced apart so that a width to center-to-center spacing ratio is between about 1/10 and about 1/1.

126. The composition according to claim 124 wherein the at least two bands have widths between about 3 millimeters and about 10 millimeters.

127. The composition according to claim 124 wherein the at least two bands have a center-to-center spacing of about 10 millimeters to about 30 millimeters.

128. The composition according to claim 101 that has properties that enable the manufacture of a bobbin of wrapper useable in a conventional commercially available cigarette manufacturing machine.

129. The composition according to claim 101 wherein the treated area is visually substantially the same as the untreated area.

130. The composition according to claim 101 further including a filler.

131. The composition according to claim 130 wherein the filler is at least one of clay, talc and calcium carbonate.

132. A method for making a smoking article having reduced ignition propensity comprising:

treating a plurality of discrete areas of paper having a base permeability with a composition initially comprising a permeability reducing substance initially dissolved in a solvent mixture initially comprising an organic component and at least one ingredient that as part of the solvent mixture is a self-association disruptor for the permeability reducing substance, to form discrete areas having a reduced permeability in an amount equivalent to that obtained with between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC); and

surrounding a tobacco column with at least a portion of the wrapper so that at least one discretely treated area substantially surrounds the tobacco column between the ends of the wrapper-surrounded tobacco column so that as a coal of a burning tobacco firecone advances by said at least one treated area, the smoking article self-extinguishes if left on a surface.

133. The method according to claim 132 wherein said ingredient is a lithium containing compound.

134. The method according to claim 132 wherein said lithium containing compound is  
5 lithium chloride in an amount that facilitates the dissolution of said permeability reducing substance in said non-derivatizing solvent mixture while upon burning the characteristic of ash for the untreated area and the at least one treated area is substantially the same.

135. The method according to claim 132 wherein said organic component is at least  
10 one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

136. The method according to claim 134 wherein said organic component is at least one of dimethylacetamide (DMAC) and N-methylpyrrolidone (NMP).

137. The method according to claim 132 wherein said permeability reducing substance  
15 is a pore filling substance thereby reducing permeability of the at least one treated area.

138. The method according to claim 132 wherein said permeability reducing substance  
is a film forming substance thereby reducing permeability of said at least one treated area.  
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139. The method according to claim 132 wherein said permeability reducing substance  
is a polysaccharide including at least one of a starch, cellulose, chitosan, chitin, alginate  
and combinations thereof.

25 140. The method according to claim 132 wherein said permeability reducing substance is a polysaccharide including a cellulose.

141. The method according to claim 140 wherein the cellulose is substantially non-derivatized.

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16A2 142. ~~The method according to claim 131 further including a filler.~~

143. The method according to claim 142 wherein the filler is at least one of clay, talc and calcium carbonate.

~~144. The method according to claim 131 further including at least one of reducing and redistributing said at least one ingredient.~~

145. The method according to claim 144 wherein said at least one of reducing and redistributing includes applying water.

146. The method according to claim 145 further including at least one of blotting and suctioning.

~~147. A method for making a wrapper for surrounding a tobacco column to create a smoking article including a least one discrete area treated with a composition to reduce a base permeability so that as a coal of a burning tobacco firecone advances by said at least one treated area, the smoking article self-extinguishes, the smoking article thereby having reduced ignition propensity comprising:~~

~~treating a plurality of discrete areas of paper having a base permeability with a composition initially comprising a permeability reducing substance initially dissolved in a solvent mixture initially comprising an organic component and at least one ingredient that as part of the solvent mixture is a self-association disruptor for the permeability reducing substance, drying the discrete areas such that the discrete areas have a reduced permeability in an amount equivalent obtained by applying between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC) thereby forming a wrapper.~~

~~148. A method for making a smoking article having reduced ignition propensity comprising:~~

~~treating a plurality of discrete areas of paper having a base permeability with a composition initially comprising a permeability reducing substance initially dissolved in a solvent mixture initially comprising an organic component and at least one ingredient that as part of the solvent mixture is a self-association disruptor for the permeability reducing~~



substance, to form discrete areas that have a reduced permeability in an amount equivalent to that obtained by applying between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC), thereby forming

5 a wrapper;

surrounding a tobacco column with at least a portion of the wrapper so that at least one discretely treated area is found between the ends of the wrapper-surrounded tobacco column so that as a coal of a burning tobacco firecone advances by said at least one treated area, the smoking article self-extinguishes if left on a surface; and

10 adding a filter element to at least one end of the wrapper surrounded tobacco column.

149. A package of smoking articles having a reduced ignition propensity comprising:

a package;

15 twenty smoking articles within said package, each smoking article comprising:

a tobacco column;

a wrapper surrounding said tobacco column so that the smoking article includes an ignition end and a distal end;

20 at least two spaced apart banded regions between the ignition end and the distal end having a combustion characteristic substantially different from that of an unbanded region, the at least two banded regions being treated with a composition in an amount equivalent to between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC); and

25 a distance from the ignition end to the at least one band of each smoking article being at least one of sequentially related, random and quasi-random within the population within the package.

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150. A grab sample of smoking articles having a reduced ignition propensity comprising:

a plurality of smoking articles, each smoking article comprising:

a tobacco column;

a wrapper surrounding said tobacco column so that the smoking article includes an ignition end and a distal end;

5 at least two spaced apart banded regions between the ignition end and the distal end having a combustion characteristic substantially different from that of an unbanded region, the at least two banded regions being treated with a composition in an amount equivalent to between about 0.3 micrograms per square millimeter to about 1.2 micrograms per square millimeter of substantially non-derivatized cellulose applied using lithium chloride in dimethylacetamide (DMAC); and

10 a distance from the ignition end to the at least one band of each smoking article being at least one of sequentially related, random and quasi-random within the population.

15 151. A cigarette paper for use in making a cigarette having reduced ignition propensity comprising:

20 a fibrous paper having a base permeability, an untreated area and a treated area, the treated area being treated with a composition initially comprising a permeability reducing substance initially dissolved in a solvent mixture initially comprising an organic component and at least one ingredient that as part of the solvent mixture is a self-association disruptor for the permeability reducing substance to reduce the base permeability so that when the paper is made into a cigarette that is smoked, as a coal of a burning tobacco firecone advances by the treated area, the cigarette self-extinguishes if placed on a surface, the composition comprising

25 a permeability reducing substance present in sufficient quantity to effect the self-extinction; and

30 a burn rate accelerating substance present in sufficient quantity to cause a smoker's organoleptic experience to be substantially indistinguishable from the organoleptic experience of smoking the untreated area of the cigarette.

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